DOCUMENT RESUME

ED 470 009 CG 032 019

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TITLE	Evidence for Construct Validities of Maruno-Kato Discussion Inventory.
PUB DATE	2002-08-00
NOTE	10p.; Paper presented at the Annual Meeting of the American Psychological Association (110th, Chicago, IL, August 22-25, 2002).
PUB TYPE	Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE	EDRS Price MF01/PC01 Plus Postage.
DESCRIPTORS	College Students; *Communication Skills; *Construct Validity; *Discussion; Higher Education; *Measures (Individuals); Personality Traits; Psychometrics; Test Validity

ABSTRACT

Maruno-Kato Discussion Inventory (MKDI) is an inventory which consists of self-rating scales measuring discussion skills and related personality traits. Previously, we demonstrated that the MKDI has adequate qualities as psychometric tests. However, to show the effectiveness or validity of the inventory further, we need to demonstrate how well self-ratings on the MKDI can predict students' actual performance in discussion situations. The purpose of this research is to show construct validity of the inventory. For the purpose, first, 43 college student participants were instructed to complete a short version of the MKDI. Second, after one week, all the participants were divided into 10 groups and ask to solve an ill-defined task collaboratively through discussion. All discussions were videotaped and transcribed. In analysis, we observed all discussions and counted individuals' verbal behaviors related to components in the MKDI. Then, we calculated the correlation coefficients between the frequencies of relevant verbal behaviors and self-rating scores from MKDI. As a result, we found that the correlations were approximately in line with our expectations. We have concluded that the data is evidence that MKDI scores can predict different aspects of students' performances in actual discussion. (Author)

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Evidence for Construct Validities of Maruno-Kato Discussion Inventory

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Evidence for Construct Validities of Maruno-Kato Discussion Inventory[1]

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Introduction

During the past decades, many educational psychologists have demonstrated that the most effective learning can be achieved if the learners actively engage in classroom practices (Palinscar, 1998). Furthermore, it is also shown that through classroom discussions, students not only understand the specific content of subjects but also acquire more general skills, such as effective communication skills, ability of thinking critically and relativistically, and positive attitudes toward learning (Johnson, Johnson, & Holubec, 1993; Maruno & Kato, 2000).

But the student-centered teaching through classroom discussions has not been successful, because students often have not acquired necessary skills and attitudes related to discussions (e.g., Rabow, Charness, Kipperman, & Radcliffe-Vasile, 1994). In order to get students to acquire those necessary skills and attitudes, therefore, educational researchers need to investigate various factors that possibly determine students' discussion performance and, based upon such investigations and theorizing, to develop educational training programs for training them to discuss more effectively.

Along this line of investigation, we have identified important domains and components on discussion behaviors and developed the Maruno-Kato Discussion Inventory (MKDI) to measure skills, attitudes, and values in relation to discussion behaviors. In the previous reports, we examined reliabilities (internal consistencies and test-retest) and criteria-related validities and demonstrated that the MKDI has reasonably adequate psychometric properties (Kato & Maruno, 2000). Further to show the effectiveness or validities of the inventory, we need to demonstrate how well self-ratings on the MKDI can predict students' actual performance in discussion

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[1] This research was supported by the Japanese Ministry of Education, Culture, Sports, Science and Technology Grant-in-aid for Scientific Research to the second author (PI: S. Maruno, Project No:11301004).

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situations.

In this report, we examined the relationships between self-rating scores on 6 subscales in the MKDI and frequencies of verbal behaviors observed in actual discussion. The MKDI can measures wide range of factors explaining individual discussion performance across 3 domains: discussion skill, monitoring ability, attitudes/values toward discussion. Here, however, we mainly examined the skill domain. This is because although discussion skills are adequate constructs as objects of observation in actual discussion, monitoring skills and attitudes/values toward discussion are the personal traits which we cannot find them easily with observation. Table 1 shows the name, definition and sample items of each component included in discussion skill domain of the MKDI.

We assume that discussion interactions consist of the following 5 functional domains: (a) providing new idea, (b) identification of the problem, (c) elaboration of one's own idea, (d) elaboration of other's idea, and (e) construction of mutual understanding (Table 2). We hypothesized that those functions have relationships with discussion skill components in the MKDI as follows.

Hypotheses:

1. Strategic inquiring: All items for strategic inquiring include to pose opposite ideas intentionally, to extend others' ideas, or to revitalize discussion. To pose an opposite idea, people usually make "objection". "Objection" behavior is included in a functional domain of "identification of the problem". Therefore, the score on strategic inquiring component is assumed to have a positive relationship with frequency of "identification of the problem".

2. Modulating of speech: In order to modulate one's speech to other's understanding, one needs to explore a more adequate expression through interaction. Explanation is one of the ways to explore the adequate expression. Explanation behavior is included in a functional domain of "elaboration of one's idea". Therefore, the score on modulating of speech component is assumed to have a positive relationship with frequency of "elaboration of one's idea".

3. Goal directedness and self-regulation: This skill includes one's ability to keep the goal directedness of discussion and to regulate one's own speech to the goal, if necessary. The former of two abilities in this component can be hypothesized to have a relationship with a functional domain. To check if one's speech is in accordance with the original goal, good discussant will ask other members whether he/she rightly understands other's previous utterance. Therefore the score on goal directedness and self-regulation component is assumed to have a

positive relationship with frequency of "construction of mutual understanding".

4. Critical thinking: Those who have a high critical thinking ability can detect inconsistencies or inadequacy in other's speech more easily. Therefore, the score on critical thinking component is assumed to have a positive relationship with frequency of "identification of the problem".

5. Discussing with fairness: People tend to hold back their opinion, in case which can lead to negative results, for example, putting them to bad position, making them take responsibilities, or resulting to negative effects on their social relationships. Especially in Japanese culture, posing objections in such a situation is socially-undesirable in general. However, people with fairness will dare to express their opinions even through objections. Therefore, the score on discussing with fairness component is assumed to have a positive relationship with frequency of "identification of problem".

6. Lack of patience: Those who are impatient at social interactions tend to add their own idea to other's speech or to interpret what other is going to say before they finish their speech. Therefore, the score on lack of patience component is assumed to have a positive relationship with frequency of "elaboration of other's idea".

By demonstrating these hypothesized relationships, we attempted to show the construct validities of the MKDI, focusing on the domain of discussion skills. We also explored to find possible relationships between the domains of monitoring ability and attitude/value in the MKDI and the 5 functional domains of verbal behavior.

Method

Participants Forty-three college students (M=16, F=27), who were enrolled in a psychology course, were asked to participate in experimental sessions.

Questionnaire A short version of the MKDI (64 items) was employed. It consists of the three domains with (1) 6 scales for discussion skill (strategic inquiring, modulation of speech to the level of others' understanding, discussion goal directedness and necessary self-regulation, lack of interpersonal patience, critical thinking, and discussing with fairness), (2) 4 scales for different types of monitoring in discussion (self/other monitoring, situational monitoring, collective monitoring, and time monitoring) and (3) 3 scales for attitude/value toward discussions (lack of self-confidence, valuing the importance of discussions, and self-obtrusiveness).

Procedure Participants completed the MKDI one week before discussion sessions took place. They were asked to rate the MKDI items on a 7-point scale how descriptive statements are of themselves, and based upon their self-rating scores, participants were assigned into one of 10 groups (each including 4-5 members) so that participant's discussion skills of each group are equally counter-balanced by their total score. A 10-minute session was repeated 3 times. Participants were told for the goal of their discussion session to come up with possible causes of teenagers' aggressive behaviors and to draw a "path-model" that show causal relation among those causes, using the white board. All discussion sessions were videotaped.

Results and Discussion

All videotaped verbal interactions were transcribed. These transcripts were coded by the first author with a coding system shown in Table 2. The analysis unit for coding was the conversational turn. Each turns were identified as either categories of verbal behavior in our coding system ("suggestion", "objection", "explanation", and so on). Total numbers for each category were calculated as personal scores. In order to summarize the results, these scores were combined into 5 functional domains as shown on the leftmost column in Table 2. These combined score were used for calculation of correlation coefficients.

Correlations between the MKDI scores and frequencies of the verbal behaviors are shown in Table 3. Most of the hypothesized relationships were demonstrated except for the relationship between modulating of speech component and elaboration of one's own idea. In addition, many unexpected positive relationships between the MKDI scores and frequencies of the verbal behaviors were also found.

Conclusion This results can be taken to provide evidence that the MKDI scores can predict different aspects of students' actual performance in group discussion. This indicates that the MKDI can be a useful tool for discussion research and individual assessment for discussion training for college students.

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Table 1 The MKDI: Sample items for skill components (Translated from Japanese version)

Component	*Brief Definition*	*Sample Item*
Strategic inquiring	This component indicates to have a skill that one can pose opposite ideas or views to others intentionally, to extend others' ideas, or to revitalize discussion.	1. To revitalize discussions, I intentionally pose opposite opinions/ideas. 2. To get people aware of what is the crucial issue here, I intentionally pose opposite opinions/ideas. 3. To check on others' understanding, I intentionally pose opposite opinions/ideas.
Modulation of speech to the level of others' understanding	This component indicates the ability to modulate one's own speech to the level of others' understanding, by changing the level of vocabulary or the method/complexity of the explanation.	1. Depending on the level of others' knowledge, I try to modulate the way of my speaking. 2. I try to choose my expressions and explanation so that other people would understand me better. 3. Depending on the level of others' knowledge, I change my words and ways of explanation.
Goal directedness and necessary self-regulation	This component includes two abilities in discussion. The first one is the ability to check whether what is discussed or one's own speech is in line with the original goal(s) of discussion. The second one is the ability to bring one's own speech and/or the group's speech back in line with the direction of the original goal(s) of discussion.	1. When my opinion gets out of tune with what others are discussing, I try to figure out how I got off the line. 2. I try to think what the essential issue is for the discussion. 3. When our discussion keeps doubling back on itself and gets nowhere, I try to think for what purpose we begin our discussion in the first place.
Critical thinking	This component indicates the ability to think skeptically about what is believed to the truth or a fact.	1. I try to be skeptical of what is believed to be a fact. 2. I try to think critically of what is believed to be a fact. 3. I try to doubt what people usually assume to be true.
Discussing with fairness	This component indicates a person's tendency to say what they think, even when their utterances can lead to negative results such as putting the speaker in a bad position, making the speaker take responsibility, or negatively effecting the speaker's social relationships.	1. Even if I might be held for responsibility, I would dare to express my opinions I believe in. 2. Even when I would be put in a bad position, I would express my opinions with fairness. 3. My concern with possible negative consequences on our relationship stops me from expressing my honest opinions.
Lack of interpersonal patience	This component indicates a person's tendency to be impatient at social interactions and to readily get frustrated with other's behavior.	1. I tend to chip in when I get frustrated with others' slow understanding. 2. I tend to chip in on others' talking. 3. I get frustrated when others think slowly.

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Table 2 Summary of coding system (translated from Tomida & Maruno (2000) and partially revised)

Functional domains	*Coding categories*	*Brief descriptions of the categories*
(a) Providing new idea	Suggestion	Posing other(s) one's idea which is relevant to the problem to be solved.
	Exploring	Posing other(s) explorative idea to find clue to the problem solving.
(b) Identification of the problem	Objection	Posing other(s) one's idea in opposition to them.
	Denying	Denying other's idea without stating any reason or alternative idea.
	Doubting	Doubting of the other member(s)' view or the knowledge shared with the members.
	Pointing out problem	Pointing out that there is a problematic part in other's previous utterance.
(c) Elaboration of one's own idea	Explanation	Explaining one's own previous utterance.
	Adding to self	Adding one's idea to own previous utterance.
(d) Elaboration of other's idea	Paraphrasing	Paraphrasing other's previous utterance.
	Interpretation	Interpreting other's previous utterance.
	Summarizing	Summarizing what is discussed until then.
	Adding to other	Adding one's idea to other's previous utterance.
(e) Construction of mutual understanding	Confirmation	Making sure that he/she rightly understands other's previous utterance.

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Table 3 Correlations between self-rating scores on the MKDI and frequencies of the relevant verbal behaviors.

	MKDI: Skills						*MKDI: Monitoring abilities*				*MKDI: Attitudes/values*		
	Strategic inquiring	Modulating of speech	Goal directedness & self-regulation	Critical thinking	Discussing with fairness	Lack of patience	self/other monitoring	situational monitoring	collective monitoring	time monitoring	valuing the discussions	lack of self-confidence	self-obtrusiveness
(a) Providing new idea	0.28 †	0.07	0.08	0.35 *	0.18	0.10	-0.10	-0.16	0.29 †	0.32 *	0.10	-0.13	0.01
(b) Identification of the problem	0.26 †	0.03	0.01	0.45 **	0.39 **	0.07	0.11	-0.50 **	0.01	-0.13	0.27 †	-0.49 **	0.10
(c) Elaboration of one's own idea	0.35 *	0.23	0.12	0.37 *	0.45 **	0.40 **	-0.07	-0.34 *	0.25	0.10	0.48 **	-0.55 **	0.17
(d) Elaboration of other's idea	0.37 *	0.15	0.11	0.36 *	0.30 †	0.25	-0.07	-0.10	0.36 *	0.35 *	0.21	-0.15	-0.18
(e) Construction of mutual understanding	0.04	0.12	0.30 †	0.21	0.00	0.24	0.26 †	-0.12	0.13	-0.08	0.19	-0.27 †	0.10

Note. † $p < .10$. * $p < .05$. ** $p < .001$

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Corporate Source: 110th Annual Convention of American Psychological Association in Chicago

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